U.S. FISH AND WILDLIFE SERVICE
SPECIES ASSESSMENT AND LISTING PRIORITY ASSIGNMENT FORM

SCIENTIFIC NAME: *Nothocestrum latifolium*

COMMON NAME: ʻAiea

LEAD REGION: Region 1

INFORMATION CURRENT AS OF: April 2010

STATUS/ACTION

___ Species assessment - determined we do not have sufficient information on file to support a proposal to list the species and, therefore, it was not elevated to Candidate status
___ New candidate
_X__ Continuing candidate
___ Non-petitioned
_X__ Petitioned - Date petition received: May 11, 2004
__ 90-day positive - FR date:
_X_ 12-month warranted but precluded - FR date: May 11, 2005
_N_ Did the petition request a reclassification of a listed species?

FOR PETITIONED CANDIDATE SPECIES:
a. Is listing warranted (if yes, see summary of threats below)? Yes
b. To date, has publication of a proposal to list been precluded by other higher priority listing actions? Yes
c. If the answer to a. and b. is "yes", provide an explanation of why the action is precluded.
Higher priority listing actions, including court-approved settlements, court-ordered and statutory deadlines for petition findings and listing determinations, emergency listing determinations, and responses to litigation, continue to preclude the proposed and final listing rules for the species. We continue to monitor populations and will change its status or implement an emergency listing if necessary. The "Progress on Revising the Lists" section of the current CNOR (*http://endangered.fws.gov/*) provides information on listing actions taken during the last 12 months.

_N_ Listing priority change
Former LPN: ___
New LP: ___
Date when the species first became a Candidate (as currently defined): October 25, 1999

___ Candidate removal: Former LP: ___
___ A – Taxon is more abundant or widespread than previously believed or not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status.

___U – Taxon not subject to the degree of threats sufficient to warrant issuance of a proposed listing or continuance of candidate status due, in part or totally, to conservation efforts that remove or reduce the threats to the species.
___ F – Range is no longer a U.S. territory.
___ I – Insufficient information exists on biological vulnerability and threats to support listing.
___ M – Taxon mistakenly included in past notice of review.
___ N – Taxon does not meet the Act's definition of "species."
___ X – Taxon believed to be extinct.

ANIMAL/PLANT GROUP AND FAMILY: Flowering plants, Solanaceae (Nightshade family)

HISTORICAL STATES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, islands of Kauai, Oahu, Molokai, Lanai, and Maui

CURRENT STATES/COUNTIES/TERRITORIES/COUNTRIES OF OCCURRENCE: Hawaii, islands of Kauai, Oahu, Molokai, Lanai, and Maui

LAND OWNERSHIP: *Nothocestrum latifolium* is found in scattered populations on State, federal, and private lands.

LEAD REGION CONTACT: Linda Belluomini, (503) 231- 6283, linda_belluomini @fws.gov

LEAD FIELD OFFICE CONTACT: Pacific Islands Fish and Wildlife Office, Christa Russell, (808) 792-9400, christa_russell@fws.gov

BIOLOGICAL INFORMATION

Species Description
Nothocestrum latifolium is a small tree up to 33 feet (ft) (10 meters (m)) tall, with a gnarled trunk, rigid ascending branches, and young parts with yellowish brown pubescence. The thick, pubescent leaves, usually clustered toward the ends of the branches, are seasonally deciduous. Flowers occur in clusters on short spurs and have a greenish yellow corolla in which the tube is about twice as long as the calyx. Berries are yellowish orange, succulent, and depressed-globose (Symon 1999, p. 1,263).

Taxonomy
Nothocestrum latifolium was described by Gray (1862). This species is recognized as a distinct taxon in Wagner *et al*. (1999, p. 1,263) and Wagner and Herbst (2003), the most recently accepted Hawaiian plant taxonomy.

Habitat/Life History
Typical habitat is dry to mesic forest and diverse mesic forest (Hawaii Biodiversity and Mapping Program (HBMP) 2008).

Historical Range

Historically, *Nothocestrum latifolium* was known from Koele, Kaohai, and Maunalei Valleys on Lanai; the southwest rift zone of Haleakala on Maui; the Kawela and Kapaakea gulches on Molokai; and Waieli, Kaumokuni, and Kupehau gulches, and Makua in the Waianae mountains of Oahu (HBMP 2008). It was never observed or collected on Kauai before 1987 but is assumed to have been there historically.

Current Range/Distribution

Currently, *Nothocestrum latifolium* is known from Kalalau on Kauai; Kanepuu on Lanai; Kapunakea Preserve in the west Maui mountains; from Auwahi to Puu Mahoe in the east Maui mountains; Puu Kolekole and Makolelau on Molokai; and from several gulches in the Waianae mountains of Oahu (HBMP 2008).

Population Estimates/Status

Nothocestrum latifolium is known from 17 populations totaling fewer than 1,200 individuals. One population on east Maui is the largest, with an estimated 1,200 individuals in 1999. The remaining populations consist of very few individuals each. There is one population of one individual on Kauai; four populations of nine individuals on Lanai; one population totaling possibly over 1,000 individuals on east Maui; one population totaling nine individuals on Molokai; and nine populations totaling 17 individuals on Oahu (W. Moses, The Nature Conservancy of Hawaii, pers. comm. 2006; F. Starr, U.S. Geological Survey, Biological Resources Discipline (USGS-BRD), pers. comm. 2006; H. Oppenheimer, Plant Extinction Prevention Program (PEP), pers. comm. 2006; HBMP 2008; P. Welton, National Park Service, pers. comm. 2010; S. Perlman, National Tropical Botanical Garden (NTBG), pers. comm. 2010; G. Kawakami, (Hawaii Division of Forestry and Wildlife (DOFAW)), pers. comm. 2010; K. Kawelo, U.S. Army Environmental, pers. comm. 2010). While the species has not been extirpated from any island, its range on each island has decreased dramatically (H. Oppenheimer, pers. comm. 2006; HBMP 2008; K. Kawelo, U.S. Army Environmental, pers. comms. 2005 and 2010).

THREATS

A. The present or threatened destruction, modification, or curtailment of its habitat or range.

Nothocestrum latifolium is threatened by feral pigs (*Sus scrofa*), goats (*Capra hircus*), and axis deer (*Axis axis*) that degrade and destroy habitat (HBMP 2008).

Pigs of Asian ancestry were introduced to Hawaii by the Polynesians, and the Eurasian type was introduced to Hawaii by Cook in 1778, with many other introductions thereafter (Tomich 1986). Some pigs raised as food escaped into the forests of Hawaii, Kauai, Oahu, Molokai, Maui, and Niihau, and are now managed as a game animal by the State to optimize hunting opportunities (Tomich 1986; State of Hawaii 2001). A study was conducted in the 1980s on feral pig populations in the Kipahulu Valley on Maui (Diong 1982). This valley consists of a diverse composition of native ecosystems, from near sea level to alpine, and forest types ranging from mesic to wet, *Acacia koa* (koa) to *Metrosideros polymorpha* (ohia). Rooting by feral pigs was observed to be related to the search for earthworms, with rooting depths averaging 8 in (20 cm), greatly disrupting the leaf litter and topsoil layers, contributing to erosion and changes in ground

topography. The feeding habits of pigs created seed beds, enabling the establishment and spread of weedy species such as *Psidium cattleianum* (strawberry guava). The study concluded that all aspects of the food habits of pigs are damaging to the structure and function of the Hawaiian forest ecosystem (Diong 1982). The effects on mesic and wet forest habitat by foraging of feral pigs have also been reported in fencing studies. In a fencing study conducted in the montane bogs of Haleakala, it was found that when feral pigs were fenced out of an area the cover of native plant species increased from 6 percent to 95 percent within six years of protection (Loope *et al*. 1991).

The goat, a species originally native to the Middle East and India, was successfully introduced to the Hawaiian Islands in 1792. Currently, populations exist on Kauai, Oahu, Maui, Molokai, and Hawaii. Goats browse on introduced grasses and native plants, trample roots and seedlings, cause erosion, and promote the invasion of alien plants. Goats are able to forage in extremely rugged terrain and have a high reproductive capacity (Clarke and Cuddihy 1980; van Riper and van Riper 1982; Scott *et al*. 1986; Tomich 1986; Culliney 1988; Cuddihy and Stone 1990). A study of goat predation on the native koa forest on the island of Hawaii has shown that grazing pressure by goats can cause the eventual extinction of koa because it is unable to reproduce (Spatz and Mueller-Dombois 1973). An exclosure analysis demonstrated that release from goat pressure by fencing resulted in an immediate recovery in height growth and numbers of vegetative resprouts of koa (Spatz and Mueller-Dombois 1973). Another study at Puuwaawaa on the island of Hawaii demonstrated that prior to management actions in 1985, regeneration of endemic shrubs and trees in the grazed area was almost totally lacking, contributing to the invasion of the forest understory by exotic grasses and weeds. After the removal of grazing animals in 1985, koa and *Metrosideros* spp. seedlings were observed germinating by the thousands (Department of Land and Natural Resources 2002).

Evidence of the activities of axis deer has been reported at the Kanepuu populations on Lanai (HBMP 2008). Axis deer were introduced to Lanai in 1959 (Tomich 1986; Hobdy 1993). After goats were eradicated from Lanai, the deer began to occupy slopes and cliffs previously thought to be too steep for them (Hobdy 1993). Currently, axis deer number approximately 6,000 to 8,000 on Lanai, and damage to the landscape has increased dramatically (D. Leone, *in litt*. 2001; The Insider 2007; WCities 2007).

Hawaiian ecosystems, having evolved without hoofed mammals, are susceptible to large-scale disturbance by feral pigs, goats, deer, and other introduced ungulates (Loope *et al*. 1991). Because of demonstrated habitat modifications by feral pigs, goats, and deer, such as destruction of native plants, disruption of topsoil leading to erosion, and establishment and spread of nonnative plants, the U.S. Fish and Wildlife Service (Service) believes they are a threat to *Nothocestrum latifolium*.

B. Overutilization for commercial, recreational, scientific, or educational purposes.
None known.

C. Disease or predation.
Predation by feral pigs, goats, and deer is a likely threat to *Nothocestrum latifolium*. In a study conducted in the 1980s, feral pigs were observed browsing on young shoots, leaves and fronds of

a wide variety plants, of which over 85 percent were endemic species (Diong 1982). A stomach content analysis in this study showed that the pigs' food sources consisted of native plants, 60 percent of which were *Cibotium* spp., (tree ferns) alternating with *Psidium cattleianum* when it was available. Pigs were observed to fell plants and remove the bark of *Clermontia*, *Cibotium*, *Coprosma*, *Psychotria*, and *Hedyotis* species, with larger trees killed over a few months of repeated feeding (Diong 1982). Goats browse on introduced grasses and native plants, and are able to reach more remote and inaccessible areas than other ungulates. They thrive on a variety of food plants, and are instrumental in the decline of native vegetation in many areas (Cuddihy and Stone 1990). Deer are primarily grazers, but also browse numerous plant species (Waring 1996).

Because Hawaii's native plants evolved without any browsing or grazing mammals present, many lost natural defenses to such impacts (Carlquist 1980). Browsing by ungulates has been observed on many other native species, including common and rare or endangered species (Cuddihy and Stone 1990; Loope *et al*. 1991). Therefore, even though we have no evidence of browsing for this species, it is likely that pigs, goats, and deer impact this species directly as well as the surrounding habitat.

D. The inadequacy of existing regulatory mechanisms.
Nothocestrum latifolium currently receives no protection under Hawaii's endangered species law (HRS, Sect. 195-D) or the Federal Endangered Species Act (16 U.S.C. §1531-1544).

Goats, pigs, and deer are managed in Hawaii as game animals, but many populate inaccessible areas where hunting is difficult, if not impossible, and therefore has little effect on their numbers (Hawaii Heritage Program 1990). Goat, pig, and deer hunting is allowed year-round or during certain months, depending on the area (Hawaii Department of Land and Natural Resources 1999, 2003); however, public hunting is not adequate to eliminate this threat to *Nothocestrum latifolium*.

E. Other natural or manmade factors affecting its continued existence.
Many alien plant species threaten this species by competing with it and degrading its habitat (HBMP 2008). The nonnative plants reported to be the greatest threats to all of the populations of *Nothocestrum latifolium* are: *Schinus terebinthifolis* (Christmas berry), *Lantana camara* (lantana), *Melinus minutiflora* (molasses grass), *Psidium cattleianum*, *Fraxinus uhdei* (tropical ash), and *Syzygium cumini* (java plum) (HBMP 2008).

Fraxinus uhdei is a tree up to 79 ft (24 m) tall, native to central and southern Mexico. In Hawaii, over 300,000 trees were planted by State foresters on all the main islands from 1924 to 1960 (Wagner *et al*. 1999, p. 991). *Fraxinus uhdei* reproduces by wind-dispersed seed. This species is considered a serious threat to the mesic *Acacia-Metrosideros* forests at Waikamoi (The Nature Conservancy 1999). It spreads rapidly along watercourses and forms dense, monotypic stands (Holt 1992). It can be controlled with herbicide application (Motooka *et al*. 2002).

Lantana camara, brought to Hawaii as an ornamental plant, is an aggressive, thicket-forming shrub which is now found on all of the main islands in mesic forest, dry shrubland, and other dry, disturbed habitats (Wagner *et al*. 1999). The most effective control agents are the lace bug

Teleonemia scrupulosa Stal. (Tingidae); the chrysomelid beetles *Octotoma scabripennis* Guerin-Meneville and *Uroplata girardi* Pi; the moths *Hypena strigata* F., *Neogalea sunia* (Guenee) (Noctuidae), and *Salbia haemorrhoidalis* Guenee (Pyralidae). While biological control of lantana by most of the established insects appeared to have reached equilibrium by 1969, the overall impact of the phytophage complex has been a steady and considerable reduction in abundance of the weed, particularly in drought-prone areas. Although lantana is considered generally to be under partial to substantial control in drier areas, it still remains a pest in some other environments, such as national parks (Hawaii Department of Agriculture 2006).

Melinus minutiflora is a grass native to Africa and now introduced to many parts of the tropics as a fodder plant. In Hawaii it is naturalized and common in dry to mesic disturbed open areas on all the main islands except Niihau. It is considered to be a serious pest, choking out and covering native vegetation and preventing seedling establishment (O'Connor 1999). The mats it forms fuel more intense fires (Cuddihy and Stone 1990).

Psidium cattleianum, a tree native to tropical America, has become widely naturalized on all the main islands of Hawaii. Found in mesic to wet forests, strawberry guava develops into dense stands in which few other plants can grow, displacing native vegetation. The fruit is eaten by pigs and birds, which then disperse the seeds throughout the forest (Smith 1985; Wagner *et al*. 1985). To date, no biological control agents have been released against strawberry guava in Hawaii, though insects for biocontrol are undergoing host-screening (Institute of Pacific Islands Forestry 2005).

Schinus terebinthifolius, a shrub native to Brazil and introduced to Hawaii in 1911, is now naturalized in mesic areas (Wagner *et al*. 1999). It forms dense thickets and grows even on steep slopes, and the red berries are attractive to birds (Smith 1989). Seedlings grow very slowly and can survive in dense shade, exhibiting vigorous growth if the canopy is cleared, leading to the creation of open habitat and further influencing and increasing its rate of spread (Brazilian Pepper Task Force 1997). *Schinus terebinthifolius* is also a relative of poison ivy and may cause allergic skin reactions on sensitive persons. There are no released biocontrol agents to date (Brazilian Pepper Task Force 1997). This species is on the Hawaii noxious weed list (Hawaii Administrative Rules (HAR) Title 4, Subtitle 6, Chapter 68).

Syzygium cumini is a tree native to India, Ceylon, and Malesia, and is widely cultivated and naturalized. In Hawaii it is naturalized in mesic valleys and disturbed forests. This species forms a dense cover, excluding all other species, and prevents the reestablishment of native lowland forest. The large black fruit is dispersed by frugivorous birds and feral pigs (*Sus scrofa*) (Pacific Island Ecosystems at Risk 2006).

The original native flora of Hawaii consisted of about 1,400 species, nearly 90 percent of which were endemic. Of the current total native and naturalized Hawaiian flora of 1,817 taxa, 47 percent are introduced species, and nearly 100 species are pests (Smith 1985; Wagner *et al*. 1999). Several studies (Cuddihy and Stone 1990; Wood and Perlman 1997; Robichaux *et al*. 1998, p. 4) indicate nonnative plant species may outcompete native plants similar to *Nothocestrum latifolium*. Competition may be for space, light, water, or nutrients, or there may be a chemical produced that inhibits growth of other plants (Smith 1985; Cuddihy and Stone

1990). In addition, nonnative pest plants found in habitat similar to that of this species have been shown to make the habitat less suitable for native species (Smathers and Gardner 1978; Smith 1985; Loope and Medeiros 1992; Medeiros *et al*. 1992; Ellshoff *et al*. 1995; Meyer and Florence 1996; Medeiros *et al*. 1997, Loope *et al*. 2004). In particular, alien pest plant species degrade habitat by modifying availability of light, altering soil-water regimes, modifying nutrient cycling, or altering fire characteristics of native plant communities (Smith 1985; Cuddihy and Stone 1990; Vitousek *et al*. 1997). Because of demonstrated habitat modification and resource competition by nonnative plant species in habitat similar to the shrubby bog habitat of *Nothocestrum latifolium*, the Service believes nonnative plant species are a threat to this species.

Although the reason is unknown, there is a lack of regeneration in *Nothocestrum latifolium* (HBMP 2008). The likely pollinator of all species in this genus, *Manduca blackburni* (Blackburn's sphinx moth), is federally listed as endangered. This moth has been extirpated from several islands, and this may be one of the causes of decline of *N. latifolium*. In addition, the larvae of the sphinx moth feed on *Nothocestrum* species, and the decline in *N. latifolium* and other species may be one of the causes for the decline in the sphinx moth, which is host specific to this genus (D. Hopper, U.S. Fish and Wildlife Service (Service), pers. comm. 1999).

CONSERVATION MEASURES PLANNED OR IMPLEMENTED

The Service has funded several projects on Maui that provide conservation benefits to *Nothocestrum latifolium*. These projects include ungulate exclosure fences in the west Maui mountains on State and private lands, and in the State's Kahakuloa Game Management Area, which has been completed (Service 2005). On east Maui, the Service has provided funding for fencing on State land within the Kanaio NAR**,** which is still in the construction stage. In addition, the Service has funded dryland forest restoration efforts on private land at Auwahi for the last several years, including a 10-acre fence that has been completed and additional fencing that is planned (Service 2001). This species is in propagation at Haleakala National Park and 20 individuals have been outplanted at Kaupo (Haleakala National Park 2008, p. 10; P. Welton, National Park Service, pers. comm. 2010).

SUMMARY OF THREATS

Based on our evaluation of habitat degradation and loss by feral pigs, goats, deer, and nonnative plants, we conclude there is sufficient information to develop a proposed rule for this species due to the present and threatened destruction, modification, or curtailment of its habitat and range, and the displacement of individuals of *Nothocestrum latifolium*, due to competition with nonnative plants for space, nutrients, water, air, and light. Predation by feral pigs, goats, and deer is a likely threat to *N. latifolium*. Reduced reproductive vigor, possibly due to the decline of its pollinator, is a likely threat to this species. We find that this species is warranted for listing throughout all of its range, and, therefore, find that it is unnecessary to analyze whether it is threatened or endangered in a significant portion of its range.

RECOMMENDED CONSERVATION MEASURES

- Survey for populations of *Nothocestrum latifolium* in areas of potentially suitable habitat
- Control feral pigs, goats, and deer
- Control alien plants

- Conduct research into lack of regeneration in the wild
- Continue propagation efforts for maintenance of genetic stock
- Reintroduce individuals into suitable habitat within historic range that is being managed for known threats to this species

LISTING PRIORITY

THREAT			
Magnitude	Immediacy	Taxonomy	Priority
High	**Imminent**	Monotypic genus	1
		Species	**2***
		Subspecies/population	3
	Non-imminent	Monotypic genus	4
		Species	5
		Subspecies/population	6
Moderate to Low	Imminent	Monotypic genus	7
		Species	8
		Subspecies/population	9
	Non-imminent	Monotypic genus	10
		Species	11
		Subspecies/population	12

Rationale for listing priority number:

Magnitude:
This species is highly threatened by feral pigs, goats, and deer that degrade and destroy habitat, nonnative plants that compete for light and nutrients, and the loss of pollinators that negatively affect the viability of this species. Threats to the dry to mesic forest habitat of *Nothocestrum latifolium*, and to individuals of this species, occur throughout its range and are expected to continue or increase without control or eradication. In addition, little regeneration is observed in this species. Ungulates have been fenced out of some areas where *N. latifolium* occurs, but the fences must be continually maintained to prevent incursion. Nonnative plant numbers have been reduced in some populations that are fenced; however, these ongoing conservation efforts for this species will benefit only a few of the known populations. The species as a whole is still impacted by these threats and will require long-term monitoring and management to maintain threat-free areas.

Imminence:
Threats to *Nothocestrum latifolium* from feral pigs, goats, and deer; nonnative plants; and the loss of pollinators, are considered imminent because they are ongoing.

Yes Have you promptly reviewed all of the information received regarding the species for the purpose of determining whether emergency listing is needed?

Is Emergency Listing Warranted? No. The species does not appear to be appropriate for emergency listing at this time because the immediacy of the threats is not so great as to imperil a significant proportion of the taxon within the time frame of the routine listing process. In addition, the Service has funded conservation actions that will benefit *Nothocestrum latifolium*, such as ungulate exclosure fences and dryland forest restoration efforts on State and private lands on Maui. If it becomes apparent that the routine listing process is not sufficient to prevent large losses that may result in this species' extinction, then the emergency rule process for this species will be initiated. We will continue to monitor the status of *N. latifolium* as new information becomes available. This review will determine if a change in status is warranted, including the need to make prompt use of emergency listing procedures.

DESCRIPTION OF MONITORING

Much of the information on this form is based on the results of a meeting of 20 botanical experts held by the Center for Plant Conservation in December of 1995. We incorporated additional information on this species from our files and the *Manual of Flowering Plants of Hawaii* (Wagner *et al*. 1999). In 2004, the Pacific Islands Office contacted the following species experts: Robert Hobdy, retired from the Hawaii Division of Forestry and Wildlife; Joel Lau, Hawaii Biodiversity and Mapping Program; Arthur Medeiros, USGS-BRD; Hank Oppenheimer, resource manager for the Maui Land and Pineapple Company; and Steve Perlman and Ken Wood, National Tropical Botanical Garden. No new information was provided. In 2005 we contacted species experts and confirmation of the status was provided by Kapua Kawelo, Army Environmental. In 2006 new status and range information was provided by Wailana Moses, The Nature Conservancy of Hawaii; Hank Oppenheimer, Plant Extinction Prevention Program; Forest Starr, USGS-BRD; and Nellie Sugii, Lyon Arboretum, and was incorporated into this assessment. New information was received in 2008 from Roy Kam, HBMP database manager, for populations found on Oahu. In 2009 we received no new information. In 2010, we contacted the species experts listed below, and received new information from Patti Welton, NPS, Steve Perlman, NTBG, Kapua Kawelo, U.S. Army Environmental, and Galen Kawakami, DOFAW.

List all experts contacted:

Name	Date	Affiliation
Agorastos, Nick	02/09/10	Hawaii Division of Forestry and Wildlife
Anderson, Stephen	02/09/10	National Park Service, Haleakala NP, Maui
Aruch, Sam	02/09/10	Private contractor
Bakutis, Ane	02/09/10	Plant Extinction Prevention Program, Molokai
Ball, Donna	02/09/10	U.S. Fish and Wildlife Service, Hawaii Island
Beavers, Sally	02/09/10	National Park Service, Hawaii Island
Bily, Pat	02/09/10	The Nature Conservancy, Maui
Bio, Kealii	02/09/10	Plant Extinction Prevention Program, Hawaii Island
Brosius, Chris	02/09/10	West Maui Mountains Watershed Partnership
Caraway, Vickie	02/09/10	Hawaii Division of Forestry and Wildlife, Oahu
Ching, Susan	02/09/10	Plant Extinction Prevention Program, Oahu

Cole, Colleen	02/09/10	Three Mountain Alliance
Conry, Paul	02/09/10	Hawaii Division of Forestry and Wildlife
Coordinator	02/09/10	East Maui Watershed Partnership
Duvall, Fern	02/09/10	Hawaii Division of Forestry and Wildlife, Maui
Fay, Kerri	02/09/10	The Nature Conservancy, Maui
Garnett, Bill	02/09/10	National Park Service, Kalaupapa, Molokai
Giffin, Jon	02/09/10	The Nature Conservancy, Hawaii Island
Haus, Bill	02/09/10	National Park Service, Haleakala NP, Maui
Higashino, Jennifer	02/09/10	U.S. Fish and Wildlife Service, Maui
Imada, Clyde	02/09/10	Bishop Museum
Jacobi, Jim	02/09/10	U.S.G.S.-Biological Resources Discipline
Kawakami, Galen	02/09/10	Hawaii Division of Forestry and Wildlife, Kauai
Kawelo, Kapua	02/09/10	U.S. Army, Environmental Division
Kier, Matt	02/09/10	U.S. Army, Environmental Division
Kiyabu, Brian	02/09/10	Amy Greenwell Botanical Garden
Kraus, Jim	02/09/10	U.S. Fish and Wildlife Service, Hakalau NWR
Medeiros, Arthur	02/09/10	U.S.G.S.- Biological Resources Discipline
Misaki, Ed	02/09/10	The Nature Conservancy, Molokai
Moriyasu, Patty	02/09/10	Volcano Rare Plant Facility, Hawaii Island
Moses, Wailana	02/09/10	The Nature Conservancy, Molokai
Nakai, Glynnis	02/09/10	U.S. Fish and Wildlife Service Maui NWR
Oppenheimer, Hank	02/09/10	Plant Extinction Prevention Program, Maui Nui
Palomino, Anna	02/09/10	Olinda Rare Plant Nursery, Maui
Palumbo, David	02/09/10	National Park Service, Haleakala NP, Maui
Pepi, Vanessa	02/09/10	U.S. Navy, Environmental Contractor
Perlman, Steve	02/09/10	National Tropical Botanical Garden
Perry, Lyman	02/09/10	Division of Forestry and Wildlife, Hawaii Island
Plunkett, Bryan	02/09/10	Lanai Forest and Watershed Partnership
Pratt, Linda	02/09/10	U.S.G.S.- Biological Resources Discipline
Purell, Melora	02/09/10	Kohala Watershed Partnership
Seidman, Stephanie	02/09/10	Maui Nui Botanical Garden
Shishido, Glenn	02/09/10	Hawaii Division of Forestry and Wildlife, Maui
Silbernagle, Mike	02/09/10	U.S. Fish and Wildlife Service Oahu NWR Complex
Smith, Miranda	02/09/10	Koolau Mountains Watershed Partnership
Starr, Forest	02/09/10	U.S.G.S.-Biological Resources Discipline
Tanaka, Daniel	02/09/10	Puu Kukui Watershed Preserve
Ward, Joe	02/09/10	Puu Kukui Watershed Preserve
Welton, Patti	02/09/10	National Park Service, Haleakala NP, Maui
Wood, Ken	02/09/10	National Tropical Botanical Garden
Wysong, Michael	02/09/10	Hawaii Natural Area Reserve System, Kauai

The Hawaii Biodiversity and Mapping Program identified this species as critically imperiled (HBMP 2006). Based on the International Union for Conservation of Nature and Natural Resources Red List of Threatened Species, this species is recognized as Endangered (facing a very high risk of extinction in the wild) (Bruegmann and Caraway 2003). *Nothocestrum*

latifolium is included in the list of species in Hawaii's 2005 Comprehensive Wildlife Conservation Strategy (Mitchell *et al*. 2005).

COORDINATION WITH STATES

On February 11, 2010, we provided the Hawaii Division of Forestry and Wildlife with copies of our most recent candidate assessments for their review and comment. We received new information from Galen Kawakami.

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APPROVAL/CONCURRENCE: Lead Regions must obtain written concurrence from all other Regions within the range of the species before recommending changes, including elevations or removals from candidate status and listing priority changes; the Regional Director must approve all such recommendations. The Director must concur on all resubmitted 12-month petition findings, additions or removal of species from candidate status, and listing priority changes.

Approve:

Acting Carolyn A. Bohan
Regional Director, Region 1, Fish and Wildlife Service

5/18/10
Date

Rowan W Gould
ACTING
Director, Fish and Wildlife Service

October 22, 2010

Concur:

Do not concur: _____ Date: _____
Director, Fish and Wildlife Service

Director's Remarks:

Date of annual review: Date: April 20, 2010
Conducted by: Cheryl Phillipson, Pacific Islands FWO
Biologist, Prelisting and Listing Program

Comments:

PIFWO Review

Reviewed by: Christa Russell Date: April 23, 2010
Prelisting and Listing Program Coordinator

Marilet Zablan Date: April 26, 2010
Assistant Field Supervisor, Endangered Species Division

Gina Shultz Date: April 30, 2010
Acting Field Supervisor